Non-native snails are introduced by a variety of means, either accidentally on ornamental plants or deliberately as fish bait. Almost all of the introduction to Travis County were probably accidental. The feral colony of *Otala lactea* could have been a deliberate introduction.

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THREE NEW PULMONATE GASTROPODS FROM THE LATE TERTIARY OF NEW MEXICO

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In the course of geological and paleontological studies of late Cenozoic deposits in northeastern New Mexico, with a colleague, Dr. John C. Frye, and under the auspices of the New Mexico Bureau of Mines and Mineral Resources, a molluscan fauna comprising some 27 species was discovered in the Kimball seed zone (Ogallala Formation, late Pliocene) sediments. Molluscan fossils in the Ogallala Formation are rare, and well-preserved shells even more so. The shells occur in caliche-cemented, fine sand, however, and shells suffered some damaged in the recovery process. Among the shells discovered in the deposit are three kinds judged to undescribed taxa. Their descriptions follow.

Type Locality: Late Pliocene deposits exposed in a small draw, tributary to Sand Draw, about 100 yards east of N. M. State Highway No. 18, and about 8 miles south of the junction of N. M. 18 and U. S. Highway 65 in Clayton, Union County, New Mexico, and situated in the SW ¼ SE ¼ sec. 2, Twp. 24 N, R 35 E, Union County, N. M., Lat. 36° 20′ 14″ N., Long. 103°, 09′ 31″ W. in an exposure known as the Clayton South Section. The types are deposited in the New Mexico Bureau of Mines and Mineral Resources, Socomo, N. M.

FIGS. 1-3. *Holotypes, Fig. 1,* Lymnaea claytonensis, *n. sp., x 5. Fig. 2,* Gastrocopta debilis, *n. sp., x 10. Fig. 3,* Gastrocopta arena, *n. sp., x 10. Magnifications approximate.*

Lymnaea claytonensis, *n. sp.*
Fig. 1

Diagnosis: A slender lymnaeid shell, having 5 to 6 rounded whorls, shouldered above, and having a laterally compressed, elliptical aperture, occupying about one-half the total length of the shell.

Description of holotype: Shell of slender lymnaeid form; whorls a little more than 5 in number, rounded and somewhat shouldered; suture well-impressed, slanting obliquely forward; aperture elliptical, outer peristome simple and thin, parietal wall adnate upon body whorl, and twisted upon the umbilicus reducing that opening to a narrow chink; nuclear 1½ whorls having granular surface, remaining whorls with distinct, slightly oblique, vertical ridges, crossed by fine spiral lines, producing a satinlike surface texture; total length, 7.0 mm, diameter, 2.80 mm, aperture length, 3.64 mm, aperture width, 2.10 mm.

The specific name, *claytonensis,* derives from the name of the section, in turn derived from the nearby town of Clayton, Union County, New Mexico. Holotype in NM 52-75-1; paratypes in NM 52-75-12.

Comparisons: Some paratypes are larger than the type (but damaged), reaching an estimated length of nearly 11 mm. The ultimate whorl on these older shells is often characterized by revolving ridges, about 5 in number; or the last whorl may be irregularly malleated. None of these features is judged to have taxonomic significance. *Lymnaea claytonensis,* although differing from them in its more slender shape, and compressed, elliptical aperture, seems to relate best to the *Lymnaea humilis-truncatula-cubensis* complex, because of the general proportions and size of the shell, and the fine spiral sculpture. Its closeness to the circumcaribbean *cubensis* may indicate a southern element in the lymnaeid fauna at this site.

Gastrocopta debilis, *n. sp.*
Fig. 2

Diagnosis: Shell small, bearing the characters of the genus, about 2.5 mm in length; whorls five, rounded; aperture irregularly rounded, peristome reflected, lip thin, having well-developed crest behind, separated from the lip by a well-developed trough; denticles 4, the two palatals weakly developed to almost absent.

Description of holotype: Shell minute, subcylindric, tapering slightly toward blunt apex; whorls five, rounded, bearing surface sculpture of fine, irregularly disposed diagonal striations, except for finely granular apical 1½ whorls; suture impressed; aperture about as high as wide, peristome reflected, thin, but bearing a callus within; margins of peristome approaching, but connected by no more than a thin wash across parietal wall; a strong crest parallels outer peristome separated from it by a trough; no impressions behind palatal folds; denticles 4: angulo-parietal simple in all views, inclined slightly toward the right; columella lamella simple horizontal, neither entering nor ascending; two palatal folds, both weakly developed, the lower more elongate and more deeply entering than the upper; basal fold absent.

The name *debilis* refers to the weakly developed palatal folds. Holotype deposited in NM 52-76-1; paratypes in NM 52-76-5.

Comparisons: There is a minimum of variation among the numerous paratypes, but what occurs is related to the strength of the two palatal folds. Among a hundred shells, four of them have palatal folds more than weakly developed, and in another four of them, the two palatal folds are essentially absent. *G. debilis* superficially resembles *G. pellucida parvidens* of Sterki but differs from that species in the simple angulo-parietal fold, and the prominent crest behind the

peristome. *G. debilis* differs from *G. corticaria* in that the latter lacks the crest behind the peristome, the angulo-parietal is not simple, and the two palatals in *corticaria* are strongly developed.

Gastrocopta arean, *n. sp.*
Fig. 3

Diagnosis: A small ovoid gastrocoptid, little more than 2.0 mm in length, having five rounded whorls, flared aperture with crest behind the peristome, and four denticles: angulo-parietal, columellar and 2 palatals.

Description of holotype: Shell elongate, ovoid, imperforate; 5 convex whorls, smooth nuclear whorl forming bluntly conic apex the granular surface texture extending to last half of ultimate whorl but beyond first 1½ nuclear whorls, overlain by fine diagonal striations, aperture having flared, simple peristome, with crest behind, the right margin extending toward, but not reaching opposite margin, to which it is connected only by thin callus; denticles 4: angular limb of angulo-parietal extending from parietal limb and joining with margin of peristome, parietal limb elevated, elongate, extending deeply within aperture; columellar lamella nearly vertical; basal lamella absent; upper palatal lamella conic and rising from a thick callus, the tip closely approaching parietal lamella; lower palatal nodular, very deeply inserted in aperture and smaller than upper palatal lamella; the palatal lamellae producing an elongate impression behind the peristome. Total length, 2.38 mm; diameter, 1.2 mm, aperture length, 0.77 mm, aperture width, 0.84 mm. *Gastrocopta arena* is known only from the holotype (NM 52-76-21) and three paratypes (NM 52-76-5) the shells of the paratypes are variously damaged.

The name *arena* refers to the fine sandy matrix from which this and other taxa of mollusca were recovered.

Comparisons: Similar in form and in the general configuration of the denticles to *G. armifera*, from which it differs by its small size, about half that of *armifera*, by the simple, untwisted columella lamella, and by the deeply immersed, nodular lower palatal lamella. The surface texture is also unique, as the granular almost waxy surface sculpture extends to the last half of the ultimate whorl, where diagonal striations suddenly begin. *G. arena* bears no resemblance to any of the small gastrocoptids known to me.

The three taxa of gastropods described above are known only from the type locality, given earlier.

The total molluscan fauna recovered from the Clayton South locality includes 25 taxa, listed as follows in generic alphabetical order:

AQUATIC	TERRESTRIAL
Ferrissia parallela (Halderman)	*Euconulus fulvus* (Müller)
Ferrissia shimeki (Pilsbry)	*Gastrocopta arena* n. sp.
Ferrissia tarda (Say)	*G. cristata* (Pilsbry & Vanatta)
Gyraulus circumstriatus (Tyron)	*G. debilis*, n. sp.
G. parvus F. C. Baker	*G. pilsbryana* (Sterki)
Lymnaea bulimoides Lea	*Hawaiia minuscula* (Binney)
L. claytonensis, n. sp.	*Pupilla blandi* Morse
L. dalli F. C. Baker	*Pupoides albilabris* (C. B. Adams)
L. parva F. C. Baker	*P. hordaceus* (Gabb)
Physa anatina Lea	*P. inornatus* Vanatta
Pisidium casertanum (Poli)	*P. modicus* (Gould)
	Succinea grosvenori Lea
	Succinea gelida F. C. Baker
	Vallonia perspectiva Sterki
	Vertigo milum (Gould)